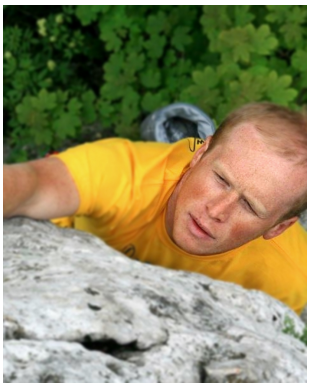
Wojciech T. **Witkowski**

Last Updated on 15th July 2021



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Languages

German- average
English- advanced
Polish- native

Interested Profile

InSAR processing
Remote Sensing
Machine Learning
Subsidence Modelling
Climate Changes

Education

2017 **PhD's Degree**
Ph.D. in Geoinformation and Mining Surveying – AGH Krakow, Poland

Doctoral thesis:
Modelling of land subsidence due to hydrological changes with artificial intelligence tools

2012 **Master's Degree**
Geoinformation and Mine Surveying – AGH Krakow, Poland

2011 **Engineer's Degree**
Geoinformation and Mine Surveying – AGH Krakow, Poland

Experience

2018-ongoing **Associate Professor at AGH University of Science and Technology**
Participation in research conducted on Faculty of Mine Surveying and Environmental Engineering. Conducting lectures with Application of mathematics; Fundamentals of Geostatistics and Artificial Intelligence; Computational and Numerical Methods; Applied Earth Observation and Geoinformation Management

2017-2018 **Teaching and Research Assistant at AGH University of Science and Technology (18 months)**
Conducting lectures with Ground Deformation and Area Protection; Land Surveying

2021 **Course on SAR interferometry (4 weeks)**
Practical training with the GAMMA software - SAR interferometric processing, practical approaches supported by GAMMA's Software modules (ISP, DIFF and GEO), scripting and processing using Python

2021 **Nature Masterclass (1 week)**
The three-part Nature Masterclasses online course in Scientific Writing and Publishing

2019-2020 **Training "R in practice" part 1 and 2 (4 weeks)**
Part 1. Advanced mathematical statistics (Bootstrap, Monte Carlo, PSM, ANOVA, PCA, Data Mining). Part 2. Machine Learning (Cross-validation, optimization of hyperparameters, regularization, prediction, GAM, MARS, LOESS, kNN, Naive Bayes, SVM, XgBoost, Caret, MLP, CNN, RNN, LSTM, Keras, TensorFlow)

2016 **Internship, TU Delft, Netherlands (3 months)**
Project "Processing and Applications of Radar Interferometry for Modeling of Discontinuous Deformations" on detection of the sinkhole precursors observed by the radar data, supervisor: Prof. Dr. Eng. Ramon Hanssen

2012 **Erasmus Program, Technische Universität Bergakademie Freiberg, Germany (6 months)**
Exchange, supervisor: Prof. Dr. Eng. Anton Sroka

Research grants and projects

2021-ongoing **Excellence Initiative – Research University**
'Gamma Remote Sensing Software – Project no. 2020/08/122 financed by Ministry of Higher Education – AGH UST, Cracow, Poland – **Team Member**

2017-ongoing **ESA Projects**
'Deformation Monitoring of Infrastructure in the Area of Intense Ground Surface Displacement' - ICEYE Project no. 64534 - **Principal Investigator**
'Determination of the Strain Tensor Deformation Based on the SAR Data' - COSMO-SkyMed Project no. 64836 - **Principal Investigator**
'Monitoring and early warning of sinkhole development using smart sensors and InSAR' – project no. 39917 – **Main Investigator**
'Application of InSAR to Model Compaction of the Aquifer System and Movement of the Land Surface in Abandoned Mines' - Cosmo-SkyMed Project no. 65954 - **Team Member**
'Possibilities of Using ICEYE Microsatellites to Estimate Glacier Surface Motion'- ICEYE Project no. 64675 - **Team Member**

2017-2020 **IGCP 641, UNESCO**
'Mechanisms, Monitoring and Modeling Earth Fissure generation and Fault activation due to subsurface Fluid exploitation (M3EF3)' - project no. IGCP 641 financed by UNESCO - **Team Member**

2015-2017 **Preludium 7 - National Science Centre**
'New Algorithm for Modelling Land Surface Subsidence Caused by The Rock Mass Drainage' – Project no. 2014/13/N/ST10/02845 financed by National Science Centre, Poland – **Principal Investigator**
Application of artificial neural networks for prediction of compaction due to dewatering of rock mass

2015-2018 **China's Belt and Road Initiative**
'Comparison of mining subsidence research in Poland and China' - Project no. G2017001 - **Team Member**

2014-2018 **National Science Centre**
'A proposed model of the upward movement voids to the surface, causing discontinuous deformation' – Project no. 2014/15/B/ST10/04892 financed by National Science Centre, Poland – **Team Member**
'Model of damage risk assessment of buildings and infrastructure due to surface deformation and decision support algorithm in terms of preserving public safety' – Project no. 2011/01/D/ST10/06958 financed by National Science Centre, Poland – **Team Member**

2014-2017 **TU Clausthal, Germany**
'Analyse von Senkungserscheinungen außerhalb des Prognostizierten Einwirkungsbereiches' - Project , TU Clausthal, Germany - **Team Member**

2013-2014 **Ministry of Science and Higher Education**
'Study the possibility of displaying the results of mathematical modeling of the transformation of the surface area' - Stage I and II, grant no. 15/11/150/243, 2013-2014 - **Main Investigator**

Publications and Conferences

2021

InSAR Observation for Horizontal Strain Tensor Determination in Mining Area / Wojciech T. WITKOWSKI, Ryszard HEJMANOWSKI // **IEEE Geoscience and Remote Sensing Letters, IF: 4.0** (under 2nd review round)
Land subsidence estimation for aquifer drainage induced by underground nining / Artur GUZY, Wojciech T. WITKOWSKI // **Energies, IF: 3.1** (under review)
A Novel Method of Horizontal Strain Tensor Determination Based on InSAR Observation / Wojciech T. WITKOWSKI, Magdalena A. ŁUKOSZ, Artur GUZY, Ryszard HEJMANOWSKI // **Minerals, IF: 2.7** (under review)
Evaluation of ICEYE microsatellites sensor for surface motion detection — Jakobshavn glacier case study / Magdalena A. ŁUKOSZ, Ryszard HEJMANOWSKI, Wojciech T. WITKOWSKI // **Energies, IF: 3.1**

2020

Software for estimation of stochastic model parameters for a compacting reservoir / Wojciech T. WITKOWSKI, Ryszard HEJMANOWSKI // **Applied Sciences, IF: 2.7**

Satellite-based monitoring and modeling of ground movements caused by water rebound / Agnieszka M. MALINOWSKA, Wojciech T. WITKOWSKI, Artur GUZY, Ryszard HEJMANOWSKI // **Remote Sensing, IF: 5.0**

2019

Sinkhole occurrence monitoring over shallow abandoned coal mines with satellite-based persistent scatterer interferometry / Agnieszka A. MALINOWSKA, Wojciech T. WITKOWSKI, Ryszard HEJMANOWSKI, Ling Chang, Freek J. van Leijen, Ramon F. Hanssen // **Engineering Geology, IF: 5.1**

An analysis applying InSAR of subsidence caused by nearby mining-induced earthquakes / Ryszard HEJMANOWSKI, Agnieszka A. MALINOWSKA, Wojciech T. WITKOWSKI, Artur GUZY // **Geosciences, CS: 3.4**

2018

Mapping of slow vertical ground movement caused by salt cavern convergence with Sentinel-1 tops data — Monitoring powolnych ruchów powierzchni terenu wynikających z konwergencji komór solnych przy wykorzystaniu zobrazowań radarowych z misji Sentinel 1 / Agnieszka MALINOWSKA, Ryszard HEJMANOWSKI, Wojciech Tomasz WITKOWSKI, Artur GUZY // **Archives of Mining Sciences, IF: 1.1**

Mapping ground movements caused by mining-induced erthquakes applying satellite radar interferometry / Agnieszka A. MALINOWSKA, Wojciech T. WITKOWSKI, Artur GUZY, Ryszard HEJMANOWSKI // **Engineering Geology, IF: 5.1**

before 2017

Suitability assessment of artificial neural network to approximate surface subsidence due to rock mass drainage / Ryszard HEJMANOWSKI, Wojciech T. WITKOWSKI // **Journal of Sustainable Mining, CS: 3.4** - 2015

Implementation of the least squares method in determining the parameters of Knothe's theory — Realizacja metody najmniejszych kwadratów w wyznaczeniu parametrów teorii Knothego / Wojciech T. WITKOWSKI // **Geomatics and Environmental Engineering, CS: 0.5** - 2014

Main Conferences

2021

IGARSS 2021 - International Geoscience and Remote Sensing Symposium, Belgium and The Netherlands, Brussels

EGU General Assembly - online

2019

Living Planet Symposium - European Space Agency, Milan, Italy, 13-17 May 2019

GeoProc 2019: earthquake and faulting mechanics, Utrecht, Netherlands, 3–5 July 2019

2018

18th International Multidisciplinary Scientific Conference of Earth and Geosciences, Vienna, Austria, 3–6 December 2018

4th Scientific Conference of Civil Engineering, Infrastructure and Mining, Cracow, Poland, 11-12 January 2018

25th International Conference Infrastructure and Environment, Dobczyce, Poland, 18-20 June 2018

2017

XIV Days of Mining Surveying and Protection of Building Facilities in Mining Areas, Ustroń, Poland

2016

XIV Days of Mining Surveying and Protection of Building Facilities in Mining Areas, Ustroń, Poland, 2017 Scientific-Technical Conference „Environmental Protection in Mining Areas", Ustroń, Poland, 19-21 October 2016
XVIII international coal preparation congress, Saint-Petersburg, Russia, 28 June – 01 July 2016
XVI international congress for mine surveying, Brisbane, Australia, 12–16 September 2016

2015

15th International Multidisciplinary Scientific Conference od Earth and Geosciences, Albena, Bulgaria,18–24 June 2015

2014

Geokinematischer Tag, TU Bergakademie Freiberg, Germany, 16-17 May 2013 and 15-16 May 2014

Activities, Societies and Award

Membership in international organizations

from 2019

IEEE Geoscience and Remote Sensing Society Membership (**GRSS**)
Member of the European Geosciences Union (**EGU**)

from 2018

Member of Mining Areas Protection Commission at the Polish Academy of Sciences (**PAN**)

from 2016

Member of PK-ISM International Society for Mine Surveying (**ISM**)

Editorial Board in Journals

from 2021

Geomatics and Environmental Engineering (ISSN Online: 2300-7095) - **Managing Editor**
Remote Sensing MDPI - Special Issue "Remote Sensing-Based Monitoring and Modeling of Ground Movements" - **Guest Editor**

Award

2020

Team 3nd degree Rector's Award for **scientific** achievements; AGH University of Science of Technology, Krakow, Poland

2019

Team 3nd degree Rector's Award for **scientific** achievements; AGH University of Science of Technology, Krakow, Poland
Team 2nd degree Rector's Award for **educational** achievements; AGH University of Science of Technology, Krakow, Poland - 2019
Team 3nd degree Rector's Award for **organizational** achievements; AGH University of Science of Technology, Krakow, Poland - 2019

2018

1st Degree Mining Engineer, AGH University of Science and Technology, Faculty of Mining and Geoengineering, Krakow, Poland

2018

Honourable mention to **PhD dissertation**

Skills

Remote Sensing: SNAP, StaMPS, GAMMA Software
Machine Learning: Matlab, R
Languages: C++, Scilab, Bash, LaTeX
Autocad, Surfer, Grapher, QGIS,
Office